



**BURLINGTON
ENVIRONMENTAL**

RCRA PERMIT
ADMINISTRATIVE FLOORED
NEW NUMBER
TOTAL NUMBER OF PERMITS

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WAD 2917

PF# 8c

6-11-93

June 11, 1993

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CERTIFIED MAIL

RCRA PERMITS SECTION

FILE COPY

Ms. Carrie Sikorski
U.S. EPA
1200 Sixth Avenue, M/S HW-106
Seattle, WA 98101

Ms. Sikorski:

Enclosed is a request for variance from the Burlington Environmental Inc. Pier 91 RFI Workplan. The variance involves waving the requirement to complete a second tidal monitoring study planned for August 1993..

If you have any questions or require further information, please contact me at (206) 654-8153.

Sincerely,

John Stiller
Project Coordinator

cc: Galen Tritt - Ecology NWRO
Bob Farrell - USEPA Consultant

USEPA RCRA



3012434



REQUEST FOR VARIANCE FROM BURLINGTON PIER 91 RFI WORK PLAN

June 9, 1993

Burlington Environmental Inc. (Burlington) requests a variance from the Burlington Pier 91 RCRA Facility Investigation (RFI) Work Plan (Burlington, April 1992; Burlington, February 1993), to conduct one tidal monitoring session, rather than two. The Tidal Monitoring Work Plan (Burlington, February 1993), which has been approved by the U.S. Environmental Protection Agency (USEPA), states that two sessions will be conducted. The relevant background information and technical justification for this variance request are presented below.

Background

As part of its conditional approval of the Pier 91 RFI Work Plan (Burlington, April 1992), the USEPA required that Burlington submit a work plan for conducting tidal monitoring to include water levels in monitoring wells, tide levels, and the stage of Lake Jacobs (letter from Michael Gearheard, USEPA, to John Stiller, July 9, 1992). This motivated Burlington to include the measurement of water levels in the shallow-aquifer monitoring wells and the stage of Lake Jacobs in the initial tidal monitoring work plan (Burlington, October 1992). That version of the work plan proposed measuring water levels at regular intervals over each of two 75-hour tidal monitoring periods. The monitoring wells were to include three two-well nests thus comprising three shallow wells and three deep wells.

Based on discussions with representatives of the USEPA in December 1992, Burlington modified the approach of the tidal monitoring to focus more on the deeper confined aquifer and less on the shallow unconfined aquifer, because the results of previous studies (Sweet-Edwards/EMCON, 1989; Converse GES, 1989, 1990a, 1990b) indicate that tidal influence on the shallow aquifer at the facility is relatively insignificant. The revised Tidal Monitoring Work Plan, approved by the USEPA in March 1993, does not include monitoring water levels in any of the shallow monitoring wells nor the stage of Lake Jacobs. The revised work plan states only that water levels in the seven deep-aquifer monitoring wells will be measured regularly throughout each of two tidal monitoring periods in March and August 1993.

Technical Justification

The first tidal monitoring plan included monitoring of both the shallow unconfined aquifer and the deep confined aquifer. Burlington's rationale for conducting two tidal monitoring sessions, as proposed in the first tidal monitoring plan, were as follows:

1. In a shallow, unconfined aquifer, the saturated thickness of the aquifer can fluctuate due to seasonal variations in recharge and discharge. These fluctuations may lead to changes in the aquifer's transmissivity because it depends on the aquifer's saturated thickness.

2. Todd (1980) shows that tidal influence (as represented by the parameters of tidal efficiency and tidal lag) on a homogeneous, one-dimensional confined aquifer depends on the storage coefficient, transmissivity, and tidal frequency. Although strictly applicable only to confined systems, the theoretical results presented by Todd should serve as a useful approximation for many unconfined systems as well.

Collectively, these results suggested that the tidal influence on an unconfined aquifer could exhibit a seasonal component due to the seasonal variation in transmissivity. It might then be desirable to conduct two or more tidal monitoring sessions at different times of the year in an unconfined aquifer, to estimate the seasonal dependence of the tidal influence.

In a confined aquifer, such as the deep aquifer at the Burlington Pier 91 facility, one would not expect the saturated thickness to experience substantial seasonal variation; nor would one expect the aquifer hydraulic properties to vary substantially on a seasonal basis. Tidal frequency does not vary substantially on a seasonal basis. Therefore it is highly unlikely that the tidal parameters exhibit substantial seasonal variation.

Since the approved tidal monitoring plan involves the measurement of water levels in only the confined aquifer (deep wells), and this aquifer is not seasonally influenced, there is no reason to conduct a second tidal monitoring session.

REFERENCES

- Burlington Environmental Inc. April 1992. RCRA Facility Investigation Work Plan, Burlington Environmental Inc. Pier 91 Facility, Seattle, Washington. Prepared for Burlington Environmental Inc.
- _____. October 1992. Tidal Monitoring Work Plan for RCRA Facility Investigation, Burlington Environmental Inc. Pier 91 Facility, Seattle, Washington. Prepared for Burlington Environmental Inc.
- _____. February 1993. Tidal Monitoring Work Plan for RCRA Facility Investigation, Burlington Environmental Inc. Pier 91 Facility, Seattle, Washington. Prepared for Burlington Environmental Inc.
- Converse GES. 1989. Preliminary Hydrogeologic Assessment Report, Terminal 91 Facility, Seattle, Washington. Prepared for Pacific Northern Oil.
- _____. 1990a. Phase I Remedial Investigation, Terminal 91 Facility, Seattle, Washington. Prepared for Pacific Northern Oil.

- _____. 1990b. Interim Product Extraction System Remedial Action Plan, Terminal 91 Facility, Seattle, Washington. Prepared for Pacific Northern Oil.
- Sweet-Edwards/EMCON. 1989. Hydrogeologic Investigation, Pier 91 Facility, Chemical Processors, Inc. Prepared for Chemical Processors Inc., Seattle, Washington.
- Todd, D. K. 1980. Groundwater Hydrology. Second Edition. John Wiley & Sons. New York. 535 pp.
- U.S. Environmental Protection Agency. July 9, 1992. Letter from Michael Gearheard, USEPA, to John Stiller, Burlington Environmental Inc.

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